



**CUMMINS INC.**  
Columbus, IN 47201  
Marine Performance Curves

Basic Engine Model  
**KTA19-M3**

Engine Configuration  
**D193080MX02**

Curve Number:  
**M-4223**

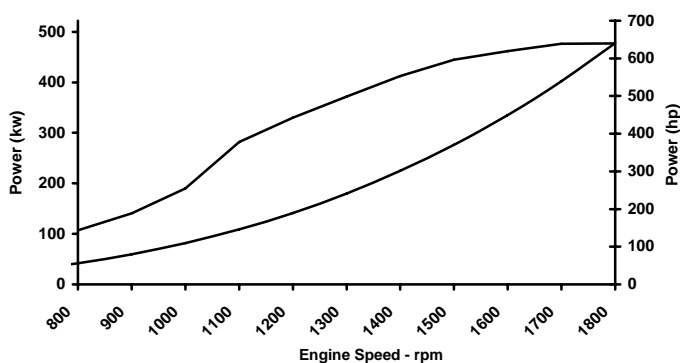
CPL Code:  
**4150**

Date:  
**9-May-07**

Displacement: **19 Liter** [1150 in<sup>3</sup>]  
Bore: **159 mm** [6.25 in]  
Stroke: **159 mm** [6.25 in]  
Fuel System: **PT**  
Cylinders: **6**

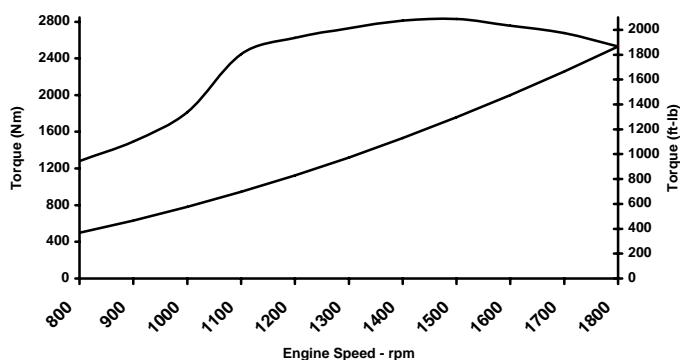
Aspiration: **Turbocharged/aftercooled**  
Rating Type: **Heavy Duty**  
kW [bhp] @ rpm  
Advertised Power: **477[640]@1800**

CERTIFIED: This marine diesel engine complies with or is certified to the:  
IMO - NOx requirements of the International Maritime Organization (IMO), MARPOL 73/78 Annex VI, Regulation 13



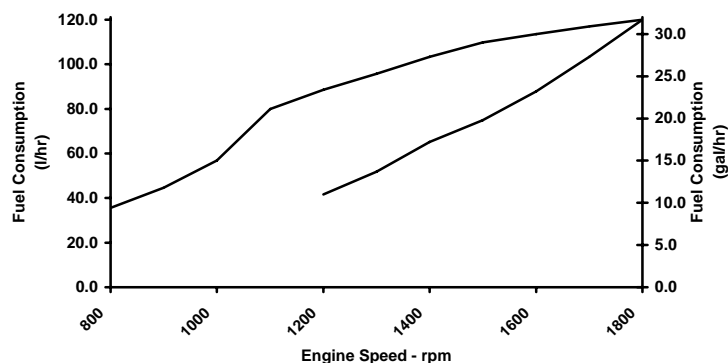
**RATED POWER OUTPUT CURVE**

rpm	kW	bhp
1800	477	640
1600	462	620
1400	412	553
1300	372	498
1100	282	378
1000	190	255
900	141	189
800	107	144



**FULL LOAD TORQUE CURVE**

rpm	N-m	ft-lb
1800	2531	1867
1600	2758	2034
1400	2812	2074
1300	2729	2013
1100	2445	1803
1000	1813	1337
900	1494	1102
800	1280	944



**FUEL CONSUMPTION - PROP CURVE**

rpm	l/hr	gal/hr
1800	119.9	31.7
1700	103.3	27.3
1600	87.8	23.2
1500	75.0	19.8
1400	65.1	17.2
1300	51.9	13.7
1200	41.6	11.0

Rated Conditions: Ratings are based upon ISO 8665 and SAE J1228 reference conditions; air pressure of 100 kPa [29.612 in Hg], air temperature 25deg. C [77 deg. F] and 30% relative humidity. Power is in accordance with IMCI procedure. Member NMMA.

Rated Curves (upper) represents rated power at the crankshaft for mature gross engine performance capabilities obtained and corrected in accordance with ISO 3046. Propeller Curve (lower) is based on a typical fixed propeller demand curve using a 3.0 exponent. Propeller Shaft Power is approximately 3% less than rated crankshaft power after typical reverse/reduction gear losses and may vary depending on the type of gear or propulsion system used.

Fuel Consumption is based on fuel of 35 deg. API gravity at 16 deg C [60 deg. F] having LHV of 42,780 kJ/kg [18390 Btu/lb] and weighing 838.9 g/liter [7.001 lb/U.S. gal].

Heavy Duty (HD): Intended for continuous use in variable load applications where full power is limited to eight (8) hours out of every ten (10) hours of operation. Also, reduced power operations must be at or below 200 rpm of the maximum rated rpm. This is an ISO 3046 fuel stop power rating and is for applications that operate 5,000 hours per year or less.

  
CHIEF ENGINEER

# Propulsion Marine Engine Performance Data

Curve No. M-4223  
DS : 4964  
CPL : 4150  
DATE: 9-May-07

## General Engine Data

Engine Model .....	KTA19-M3
Rating Type .....	Heavy Duty
Rated Engine Power .....	477 [640]
Rated Engine Speed .....	1800
Rated Power Production Tolerance .....	3
Rated Engine Torque .....	2531 [1867]
Peak Engine Torque @ 1400 rpm .....	2830 [2087]
Brake Mean Effective Pressure .....	1687 [245]
Indicated Mean Effective Pressure .....	1929 [280]
Minimum Idle Speed Setting .....	650
Normal Idle Speed Variation .....	25
High Idle Speed Range Minimum .....	1815
Maximum .....	2016
Maximum Allowable Engine Speed .....	N.A.
Maximum Torque Capacity from Front of Crank <sup>2</sup> .....	2531 [1867]
Compression Ratio .....	13.8:1
Piston Speed .....	10 [1875]
Firing Order .....	1-5-3-6-2-4
Weight (Dry) - Engine Only - Average .....	2073 [4570]
Weight (Dry) - Engine With Heat Exchanger System - Average .....	2251 [4962]
Weight Tolerance (Dry) Engine Only .....	10.0

## Noise and Vibration

Average Noise Level - Top	(Idle) .....	dBa @ 1m	N.A.
	(Rated) .....	dBa @ 1m	N.A.
Average Noise Level - Right Side	(Idle) .....	dBa @ 1m	N.A.
	(Rated) .....	dBa @ 1m	N.A.
Average Noise Level - Left Side	(Idle) .....	dBa @ 1m	N.A.
	(Rated) .....	dBa @ 1m	N.A.
Average Noise Level - Front	(Idle) .....	dBa @ 1m	N.A.
	(Rated) .....	dBa @ 1m	N.A.

## Fuel System<sup>1</sup>

Avg. Fuel Consumption - ISO 8178 E3 Standard Test Cycle .....	84 [22]
Fuel Consumption at Rated Speed .....	120 [32]
Approximate Fuel Flow to Pump .....	212 [56]
Maximum Allowable Fuel Supply to Pump Temperature .....	60 [140]
Approximate Fuel Flow Return to Tank .....	92 [24]
Approximate Fuel Return to Tank Temperature .....	52 [125]
Maximum Heat Rejection to Drain Fuel .....	1 [31]
Fuel Transfer Pump Pressure Range .....	N.A.
Fuel Pressure - Pump Out/Rail . Mechanical Gauge .....	1096 [159]
INSITE Reading .....	1200 [174]

## Air System<sup>1</sup>

Intake Manifold Pressure .....	186 [55]
Intake Air Flow .....	604 [1280]
Heat Rejection to Ambient .....	24 [1366]

TBD= To Be Determined

N/A = Not Applicable

N.A. = Not Available

<sup>1</sup> All Data at Rated Conditions.

<sup>2</sup> Consult Installation Direction Booklet for Limitations.

<sup>3</sup> Heat rejection to coolant values are based on 50% water/50% ethylene glycol mix and do NOT include fouling factors. If sourcing your own cooler, a service fouling factor should be applied according to the cooler manufacturer's recommendation.

<sup>4</sup> Consult option notes for flow specifications of optional Cummins seawater pumps, if applicable.

<sup>5</sup> May not be at rated load and speed. Maximum heat rejection may occur at other than rated conditions.

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COLUMBUS, INDIANA

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<http://www.cummins.com>

# Propulsion Marine Engine Performance Data

Curve No. M-4223  
DS : 4964  
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DATE: 9-May-07

## Exhaust System<sup>1</sup>

Exhaust Gas Flow .....	l/sec [cfm]	1345 [2,850]
Exhaust Gas Temperature (Turbine Out) .....	°C [°F]	436 [816]
Exhaust Gas Temperature (Manifold) .....	°C [°F]	594 [1,100]

## Emissions (in accordance with ISO 8178 Cycle E3)

NOx (Oxides of Nitrogen) .....	g/kw-hr [g/hp-hr]	9.66 [7.20]
HC (Hydrocarbons) .....	g/kw-hr [g/hp-hr]	0.72 [0.54]
CO (Carbon Monoxide) .....	g/kw-hr [g/hp-hr]	3.14 [2.34]
PM (Particulate Matter) .....	g/kw-hr [g/hp-hr]	N.A.

## Cooling System<sup>1</sup>

Sea Water Pump Specifications .....	MAB 0.08.17-07/16/2001	
Pressure Cap Rating (With Heat Exchanger Option) .....	kPa [psi]	103 [15]

## Engines without Low Temperature Aftercooling (LTA )

### Jacket Water Aftercooled Engine (JWAC)

Coolant Flow to Engine Heat Exchanger .....	l/min [gal/min]	644 [170]
Standard Thermostat Operating Range (Start to Open) .....	°C [°F]	82 [180]
Standard Thermostat Operating Range (Full Open) .....	°C [°F]	95 [202]
Heat Rejection to Engine Coolant <sup>3</sup> .....	kW [Btu/min]	370 [21087]

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